PERFORMANCE REPORT

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INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2010 Survey Report

Richland-Chambers Reservoir

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TABLE OF CONTENTS

SURVEY AND MANAGEMENT SUMMARY

Fish populations in Richland-Chambers Reservoir were surveyed in 2010 and 2011 using electrofishing, gill netting, and trap netting. A structural habitat and an aquatic vegetation survey were conducted in August 2010. Anglers were surveyed from June 2010 through May 2011 with a creel survey. This report summarizes the results of the surveys and contains a management plan for the reservoir.

- **Reservoir description:** Richland-Chambers Reservoir is a 41,356-acre reservoir on the Richland and Chambers Creek tributaries of the Trinity River. Boat access is adequate, but bank angler access is limited. Boats can be launched from 10 boat ramps surrounding the lake, of which 6 are designated as public access. There are no handicap-specific facilities, but most are accessible. Aquatic vegetation was scarce due to high annual water level fluctuation. Anglers expended approximately 87,679 hours of fishing effort and spent an estimated $1,021,728 during the June 2010 through May 2011 creel survey.

- **Management history:** Important sportfish include palmetto and white bass, largemouth bass, blue and channel catfishes, and white and black crappie. Supplemental stocking of Florida largemouth bass was conducted in 2010 and 2011. Requests for stocking of palmetto bass have been submitted annually and in most years stockings were accomplished. Supplemental gill netting and trap netting were conducted in 2008 and 2009, respectively, in order to monitor the popular temperate bass, catfish, and crappie fish populations. A creel survey was conducted in 2010 and 2011.

- **Fish community**
  - **Prey species:** Gizzard shad, threadfin shad, and sunfishes were the most abundant prey species and provided ample prey for sport fish**.**

  - **Catfishes:** The catfish fishery was tied with crappie as 3rd most popular in Richland-Chambers Reservoir. Blue catfish are typically more abundant than channel catfish. An experimental “trophy” blue catfish regulation was adopted for the reservoir in 2009 to increase the number of large blue catfish.

  - **Temperate basses:** Temperate basses, white bass and palmetto bass, were the most sought-after species group and made up 39% of the directed fishing effort in 2010-2011. Gill net catch rate of palmetto bass declined since 2007, reflecting inconsistent stocking density.

  - **Largemouth bass:** Largemouth bass was the second most sought-after species by anglers at Richland-Chambers Reservoir, and tournament effort comprised 42% of all angler effort for largemouth bass in the 2010-2011 creel survey. Few largemouth bass >14 inches were collected during the fall 2010 electrofishing survey.

  - **Crappie:** White crappie have historically been more abundant than black crappie although similar numbers of both species were harvested in the 2010-2011 creel survey. Crappies were the third most popular fishery, tied with catfish, at Richland-Chambers.

- **Management strategies:** Stock palmetto bass at 10/acre, and monitor palmetto bass and catfish populations with biennial gill netting in 2013 and 2015. Monitor largemouth bass population in 2014 with fall electrofishing. Continue to monitor for exotic species presence and educate resource users. Provide written and verbal news information on fisheries management activities and issues relevant to Richland-Chambers Reservoir to appropriate media outlets.

INTRODUCTION

This document is a summary of fisheries data collected from Richland-Chambers Reservoir from June 2010 through May 2011. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. While information on other species of fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2010 and 2011 data for comparison when appropriate.

Reservoir Description

Richland-Chambers Reservoir is a 41,356-acre reservoir on the Richland and Chambers Creek tributaries of the Trinity River. The reservoir was completed in 1987 to provide water for municipal and industrial purposes. Aquatic vegetation has traditionally been scarce (occupying <10% of the shoreline). In 2002, both hydrilla (*Hydrilla verticillata*) and native aquatic vegetation expanded in the littoral area of the reservoir (Ott and Bister, 2003). Currently, hydrilla along with native submersed species occupies <1% of total reservoir surface area. Richland-Chambers Reservoir is in the mid-range of eutrophic reservoirs in Texas with a mean TSI chl-a of 51.24 (Texas Commission on Environmental Quality 2008). The littoral zone consists of a variety of physical habitat types (Table 4). The majority of the shoreline is featureless (70%), while combinations consisting of bulkhead, eroded shoreline, and riprap make up the remainder. Boat access is adequate, but bank angler access is limited. Boats can be launched from 10 boat ramps surrounding the lake, of which 6 are designated as public access. There are no handicap-specific facilities, but most are accessible. Other descriptive characteristics for Richland-Chambers Reservoir are found in Table 1.

Management History

Previous management strategies and actions: Management strategies and actions from the previous survey report (Beck and Ott 2007) included:

1. Monitor largemouth bass size distribution and Florida largemouth bass (Micropterus salmoides floridanus) allele frequency in the population.
   Action: Stockings of Florida largemouth bass were conducted in 2006, 2007, 2010, and 2011. Florida largemouth allele frequency was not evaluated in 2006 or 2010 due to stockings in the same year.

2. Stock palmetto bass (Morone chrysops x M. saxatilis) at 10/acre. Monitor palmetto bass population by gill netting in spring 2009. Assess angler utilization of palmetto bass fishery by conducting a creel survey from June 2010 through May 2011.
   Action: Additional gill netting was conducted in spring 2009 to monitor the population. Richland-Chambers Reservoir was given the highest priority for annual palmetto stockings, though a full stocking has not been received since 2008 due to reduced availability. An access-point angler creel survey was conducted from June 2010 through May 2011 to assess angler utilization.

3. Continue to monitor the distribution of hydrilla in the reservoir and recommend treatment to controlling authority if necessary.
   Action: A vegetation survey was conducted in 2010, and found all species of aquatic vegetation to cover <1% of reservoir surface area. No management actions have been required or recommended.

4. Continue promoting Richland-Chambers Reservoir in news releases and continue presentations to angling clubs promoting angling opportunities in the Dallas/Fort Worth area.
   Action: Outdoor writers around the reservoir and state were provided with news releases and information about the fishery. An experimental regulation change to protect trophy blue catfish went into effect in September 2009, and lake-specific regulation

posters were distributed to vendors of angling-oriented businesses in the Richland-Chambers Reservoir area.

Harvest regulation history: With the exception of blue catfish, sport fishes in Richland-Chambers Reservoir are currently managed with statewide harvest regulations (Table 2). An experimental slot-length limit to protect trophy blue catfish went into effect in September 2009. For blue catfish, harvested fish may be any size below 30 inches, but only one fish over 45 inches is allowed as part of the 25-fish daily bag limit in combination with channel catfish.

Stocking history: Palmetto bass have been requested annually for Richland-Chambers Reservoir at a rate of 10/acre. The reservoir did not receive palmetto bass stocking in 2007, and has not received a full stocking since 2008 due to limited availability. Florida largemouth bass were first stocked in 1988, and were stocked in 1989, 1991, 1999, 2001, 2002, 2006, 2007, 2010, and 2011 to maintain the trophy potential of the reservoir. A complete stocking history is found in Table 3.

Vegetation/habitat history: Richland-Chambers Reservoir has typically contained little aquatic vegetation. This is likely the result of heavy wind action, turbidity, and high annual water level fluctuation. Hydrilla has expanded in the past during periods of stable water levels, but occupied only 40 acres (0.1%) in a 2010 vegetation survey. A structural habitat survey was completed in 2010, and results were similar to 2002, indicating shoreline development has been stable (Table 4).

Water Transfer: Richland-Chambers Reservoir was built by the Tarrant Regional Water District (TRWD) for municipal water supply. TRWD is currently a water wholesaler to more than ten counties in Texas in the Dallas and Fort Worth (DFW) metropolitan complex. Multiple lake area municipalities, such as Corsicana, will be able to draw water directly from the reservoir this year or also pump water into Lake Halbert. Raw water is also transferred from the reservoir through the current East Texas Pipeline and converges with water from Cedar Creek Reservoir near Waxahachie, Texas. Water from the pipeline is available along a grid system to multiple water treatment plants in the DFW area, including Waxahachie, Midlothian, and Fort Worth.

Raw water from Richland-Chambers Reservoir has the potential to be introduced directly or indirectly into reservoirs Bardwell, Benbrook, Halbert, Joe Pool, Mountain Creek, Arlington, Eagle Mountain, and Lake Worth; all with subsequent return into the Trinity River. The TRWD also maintains a pumping station on the Trinity River to filter raw river water through wetland cells before transmission through an additional pumping station into Richland Chambers; however, this is temporarily discontinued due to an upgrade to the pumps. The TRWD and the City of Dallas Water Utilities have partnered to construct an Integrated Pipeline (IPL) Project, which will create further connections between municipalities and reservoirs including Lake Palestine.

METHODS

Fishes were collected by electrofishing (2 hours at 24, 5-min stations), gill netting (15 net nights at 15 stations), and trap netting (15 net nights at 15 stations). Blue catfish were also collected by jug line and electrofishing. Catch per unit effort (CPUE) for jug lines was recorded as the number of fish caught per jug line night (fish/jn). Each jug line contained a float, weight, and three hooks. Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing and, for gill and trap nets, as the number of fish caught per net night (fish/nn). All survey sites were randomly selected and all surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2009). Blue catfish ages were determined for fish collected by jug line in winter 2009 and 2010 and gill net in spring 2009 for evaluation of the experimental slot-length limit (Appendix C).

Sampling statistics (CPUE for various length categories), structural indices [Proportional Size Distribution (PSD), as defined by Guy et al. (2007)], and condition indices [relative weights (W_r)] were calculated for target fishes according to Anderson and Neumann (1996). Index of vulnerability (IOV) was calculated for

gizzard shad (*Dorosoma cepedianum*) (DiCenzo et al. 1996). Relative standard error (RSE = 100 X SE of the estimate/estimate) was calculated for all CPUE statistics and for creel statistics and SE was calculated for structural indices and IOV. Water level data were obtained from the United States Geological Survey (USGS) website.

An access creel survey (9 days per quarter; 4 weekdays and 5 weekend days) was conducted from June 2010 through May 2011 to assess angler use and catch in accordance with the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2009). Angler counts and interviews were conducted at two boat ramps on each day. Aquatic vegetation, physical habitat, and angler access surveys were conducted in 2010 in accordance with the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2009). Coverage and linear shoreline habitat distances were calculated for all prevalent species and physical habitat types.

RESULTS AND DISCUSSION

Habitat: A vegetation survey of the littoral zone was conducted in 2010. Native submersed species included coontail (*Ceratophyllum demersum*), water stargrass (*Heteranthera dubia*), Nitella (*Nitella spp.*), and pondweed (*Potamogeton spp.*). Emergent vegetation was composed of Water-willow (*Justicia americana*), water primrose (*Ludwigia spp*), American lotus (*Nelumbo lutea*), and cattail (*Typha spp.*). Total coverage was less than one percent of reservoir surface area. Water levels fluctuate 5-6 feet annually (Figure 1) and may be the primary reason for the low abundance of aquatic vegetation. Native submersed vegetation occupied less than 1 acre of the total reservoir surface area (Table 4). Hydrilla (exotic submersed) was still present, but covered <1% of the total area. Bulkhead and riprap occupied about 25% of the shoreline habitat in 2010. Submersed trees and stumps were still present in the upper ends Richland and Chambers creek arms of the reservoir. Open water was abundant and was suitable for pelagic predators.

Creel: Similar to previous survey years, fishing effort at Richland-Chambers Reservoir was primarily directed at temperate basses (39%) and largemouth bass (19%) (Table 5). Crappie and catfish were also important target species, each with 16% of fishing effort. Total fishing effort (87,679 h) and total directed expenditures ($1,021,728) declined from previous survey years (Table 6).

Prey species: Primary prey species included gizzard shad, threadfin shad (*D. petenense*), and bluegill (*Lepomis macrochirus*). Combined catch rates of gizzard and threadfin shad were high (604/h) (Figure 2) and most gizzard shad were available as prey (IOV=89). Sunfish abundance was moderate (185.5/hour), and consisted of bluegill, longear sunfish (*L. megalotis*), redear sunfish (*L. microlophus*), redbreast sunfish (*L. auritus*), and warmouth sunfish (*L. gulosus*). Body condition (W_r) of bluegill sunfish was good (>90%) for all size classes (Figure 3). There was no directed effort toward sunfish observed during the 2010-2011 creel period.

Catfishes: Directed effort for catfishes (*Ictalurus spp.*) increased from previous creel surveys to 16% of the total directed effort made by rod-and-reel anglers at Richland-Chambers Reservoir (Table 5). Anglers harvested an estimated 6,859 blue catfish (*I. furcatus*) and 767 channel catfish (*I. punctatus*) (Table 7). Illegal harvest of 11-inch channel catfish was observed during the creel survey (Figure 7); although, this harvest was by an individual angler who was confused about the experimental regulation for blue catfish. Effort from passive gears (trotline and jugline) was not determined by the traditional creel survey; though passive gears are believed to represent a significant fishery. Gill net catch rate of blue catfish in 2010 (31.7/nn) improved from previous surveys in 2009 (22.8/nn) and 2007 (12.4/nn) (Figure 4). Age and growth analysis of blue catfish (Appendix C) indicated that it may take a decade for blue catfish to reach quality size (>20 inches), and fifteen or more years to grow into the protected slot. Channel catfish were less abundant than blue catfish, though catch rates in 2010 (1.2/nn) were similar to 2009 (1.4/nn) (Figure 5). Channel catfish accounted for approximately 10% of catfish harvest by rod and reel anglers in the 2010-2011 creel survey (Table 7).

Temperate basses: Temperate basses (*Morone spp.*) were the most sought-after species group at

Richland-Chambers Reservoir, accounting for 39% of the total directed angling effort (Table 5). Angling catch rate remains good for temperate basses with anglers catching 3.8/hour (Table 8). An estimated 70,588 white bass were harvested over the 12-month creel period, which was lower than previous estimates and reflects a decline in total fishing pressure (Table 8). White bass gill net catch rate in 2011 (5.0/nn) has improved since previous surveys (2009; 3.6/nn and 2007; 3.2/nn) (Figure 8). Average age for white bass at 10-inches (9.0-10.8) was 1 year (N =13, range 1 year). Although gill net catch rate of palmetto bass (*M. chrysops* x *saxatilis*) increased in 2011 (1.3/nn) from 2009 (0.7/nn), it decreased substantially from 2007 (6.1/nn) (Figure 9). Insufficient numbers of palmetto bass were collected for age and growth analysis.

Black bass: Angling effort for largemouth bass was lower than previous years, approximating 19% of the directed effort (Table 5). A large proportion (42%) of the directed effort for largemouth bass was tournament-related, which was consistent with the proportion of tournament effort (59%) in the 2006-2007 angler creel survey (Table 5). Angling catch rates were similar to previous years at 0.5/h (Table 9). An estimated 2,106 largemouth bass were harvested during the 2010-2011 creel period, although traditional harvest only accounted for 10% of total harvest (Figure 13). Tournament-retained largemouth bass were reported in the 2010-2011 angler creel survey up to 26 inches. Electrofishing catch rate in 2010 (35.5/h) was higher than surveys in 2004 (22/h) and 2006 (14.7/h), although size distribution was poor (PSD=14) which may be partially reflective of low water levels at the time of survey and an abundance of small fish in samples (Figure 12). Limited habitat availability for largemouth bass may also limit growth and abundance of bass. Catch rate of stock-size fish (≥8 inches) was similar to previous surveys (14.5/h), though the proportion of harvestable fish (≥14 inches) fish was low (PSD-14=3). Average age of largemouth bass at 14 inches (13-14.9) was 2.3 years (N=14, range 2-3 years). Relative weight (W_r) for most size classes of largemouth bass (Figure 12) was good (>90%) and prey availability was high.

Crappie: Crappie (*Pomoxis spp.*) were the third most sought-after sport fish group tied with catfish at Richland-Chambers Reservoir in 2010-2011, accounting for 16% of the directed effort (Table 5). Angling catch rate was 2.0/h which was consistent with catch rates during the previous angler creel survey (Table 10). An estimated 8,272 white crappie (*P. annularis*) and 8,933 black crappie (P. nigromaculatus) were harvested from June 2010 through May 2011 (Table 10). The trap net catch rate of white crappie in 2010 (3.0/nn) was higher than 2009 (1.3/nn) and in line with historic averages. Catch rate of white crappie was considerably lower than a high of 43.5/nn in 2006 (Figure 14). The size distribution of white crappie in 2010 was good (PSD=34). Relative weight was adequate (W_r > 95) for all length classes. Insufficient samples were collected to determine age and growth for white and black crappie. The trap net catch rate of black crappie in 2010 (0.7/nn) was similar to 2006 (0.8/nn) survey (Figure 15).

Fisheries management plan for Richland-Chambers Reservoir, Texas

Prepared – July 2011

ISSUE 1: Florida largemouth bass fingerlings were stocked in 2010 and 2011 to increase the trophy potential of the reservoir. Although some legal-length largemouth were observed during creel surveys, few fish >14 inches were observed during electrofishing surveys in 2010.

MANAGEMENT STRATEGIES

1. If substantial increases in available habitat are observed, request stocking of FLMB (500,000 fingerlings) to improve trophy largemouth bass potential.
2. Examine largemouth bass growth every four years.
3. Collect largemouth bass and assess allele frequency of Florida largemouth bass in 2014.

ISSUE 2: Annual stockings of palmetto bass (combined with natural recruitment of white bass) have developed an excellent fishery that is utilized by many anglers and accounts for the majority of the directed effort of this reservoir. Because the high demand for this species and consumptive nature of the fishery, annual stockings are required to maintain the quality of this fishery.

MANAGEMENT STRATEGIES

1. Continue to request annual stockings of palmetto bass at 10/acre.
2. Provide assistance to private parties interested in funding supplemental stockings of palmetto or sunshine bass.
3. Conduct additional gill netting in spring of 2013 to evaluate palmetto bass population characteristics.
4. Conduct harvest assessment of palmetto bass during a creel survey conducted from June 2014-May 2015.

ISSUE 3: Hydrilla and alligatorweed are present in low abundance in the reservoir and have the potential to become problematic in the future in high-traffic areas.

MANAGEMENT STRATEGIES

1. Continue to monitor the presence and coverage of exotic species in the reservoir through cursory inspections and a vegetation survey in 2014.
2. Review treatment plans as submitted by property owners or the controlling authority and provide technical assistance.

ISSUE 4: Richland-Chambers Reservoir offers substantial recreational angling opportunities and could benefit from additional promotion.

MANAGEMENT STRATEGIES

1. Continue promoting Richland-Chambers Reservoir in news releases and continue presentations to angling clubs promoting angling opportunities in the area.

ISSUE 5: A considerable catfish fishery exists. The rod-and-reel catfish fishery was similar in popularity to the crappie and largemouth bass fishery, and there is also believed to exist a substantial passive-gear fishery for catfish. An experimental 30- to 45-inch slot-length limit for blue catfish was implemented in September, 2009 to improve the trophy potential of the fishery.

MANAGEMENT STRATEGIES

1. Conduct gill netting surveys every two years to monitor catfish populations and examine growth every four years.
2. Conduct experimental juglining in winter 2015-2016 to evaluate the experimental slot-length limit to increase size distribution of passive gear caught blue catfish.

ISSUE 6: Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example, zebra mussels (*Dreissena polymorpha*) can multiply rapidly and attach themselves to any available hard structure, restricting water flow in pipes, fouling swimming beaches and plugging engine cooling systems. Giant Salvinia (*Salvinia molesta*) and other invasive vegetation species can form dense mats, interfering with recreational activities like fishing, boating, skiing and swimming. The financial costs of controlling and/or eradicating these types of invasive species are significant. Additionally, the potential for invasive species to spread to other river drainages and reservoirs via watercraft and other means is a serious threat to all public waters of the state.

MANAGEMENT STRATEGIES

1. Cooperate with the controlling authority to post appropriate signage at access points around the reservoir.
2. Contact and educate marina owners about invasive species, and provide them with posters, literature, etc… so that they can in turn educate their customers.
3. Educate the public about invasive species through the use of media and the internet.
4. Make a speaking point about invasive species when presenting to constituent and user groups.
5. Keep track of (i.e., map) existing and future inter-basin water transfers to facilitate potential invasive species responses.

SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes standard electrofishing every four years, and additional gill netting and trap netting every two years. Angler access will be surveyed every four years. A creel survey will be conducted from June 2014 through May 2015 to monitor angler effort, catch, harvest, and economic practices. Gill netting surveys will be conducted every two years to adequately monitor catfish populations and evaluate the experimental slot length limit for blue catfish as well as the success of palmetto bass stockings. Growth of largemouth bass, catfish, temperate bass, and crappie will be examined every four years.

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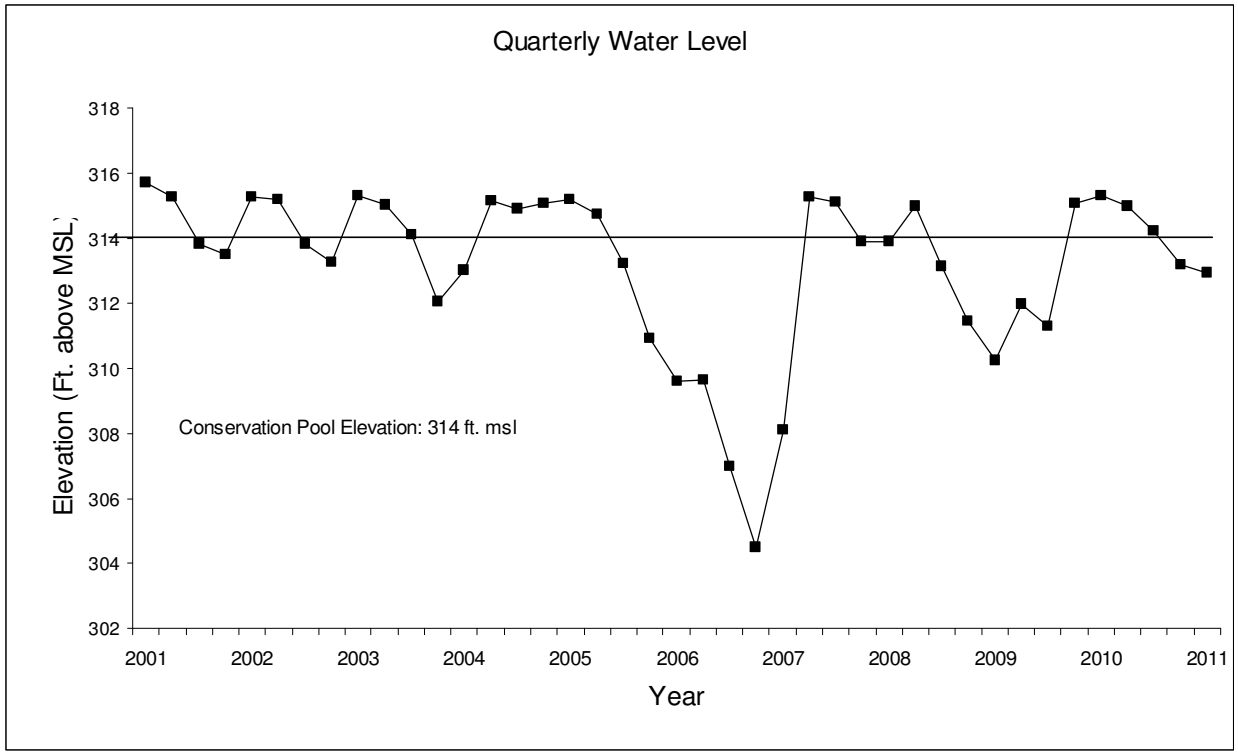


Figure 1. Quarterly water level elevations in feet above mean sea level (MSL) recorded for Richland-Chambers Reservoir, Texas.

Table 1. Characteristics of Richland-Chambers Reservoir, Texas.

Characteristic	Description
Year constructed	1987
Controlling authority	Tarrant Regional Water District
Counties	Freestone (dam), Navarro
Reservoir type	Mainstream
Shoreline Development Index (SDI)	11.2
Conductivity	300 umhos/cm

Table 2. Harvest regulations for Richland-Chambers Reservoir, Texas.

Species	Bag Limit	Minimum-Maximum Length (inches)
Catfish, Blue	25[a] (1 fish 45 inches or longer)	30 – 45 slot length limit
Catfish, Channel	25[a]	12 - No Limit
Catfish, Flathead	5	18 - No Limit
Bass, White	25	10 – No Limit
Bass, Palmetto	5	18 – No Limit
Bass, Largemouth	5	14 – No Limit
Crappie, White and Black	25 (in any combination)	10 - No Limit

[a] The daily bag limit for channel and blue catfish is 25 in any combination.

Table 3. Stocking History of Richland-Chambers Reservoir, Texas. Size categories are: FRY <1 inch; FGL = 1-3 inches; and Adult.

Species	Year	Number Stocked	Size
Catfish, Blue	1988	42,750	FGL
	1988	4,222	Adult
	Total	46,972	
Catfish, Channel	1988	193,202	FRY
Bass, Palmetto (White x Striped)	1996	100,861	FGL
	1997	117,576	FGL
	1998	227,618	FGL
	1999	225,598	FGL
	2002	112,070	FGL
	2003	103,300	FGL
	2004	205,895	FGL
	2005	413,686	FGL
	2006	150,753	FGL
	2008	415,646	FGL
	2009	249,657	FGL
	2010	64,036	FGL
	2010	2,072,137	FRY
	2011	100,602	FGL
	Total	4,559,435	
Bluegill, Coppernose	1988	659,598	
	1989	1,042,071	
	Total	1,701,669	
Bass, Florida Largemouth	1988	547,329	FGL
	1989	1,114,186	FRY
	1991	160,317	FRY
	1991	339,000	FGL
	1999	644	FGL
	2001	485,519	FGL
	2002	423,715	FGL
	2006	420,129	FGL
	2007	501,630	FGL
	2010	377,318	FGL
	2011	500,538	FGL
	Total	4,870,325	
Bass, ShareLunker Largemouth	2008	9,739	FGL

Table 4. Survey of littoral zone and physical habitat types, Richland-Chambers Reservoir, Texas. Structural habitat survey and aquatic vegetation survey were conducted in 2010. A linear shoreline distance (miles) was recorded for each habitat type found. Surface area (acres) and percent of reservoir surface area was determined for type of aquatic vegetation found.

Shoreline habitat type	Shoreline distance		Surface area	
	Miles	Percent of total	Acres	Percent of reservoir surface area
Bulkhead[1]	56.3	17		
Eroded shoreline[1]	34.1	11		
Rip rap[1]	4.4	2		
Featureless[1]	235.2	70		
Native emergent			17	0.04
Native submersed				
American pondweed			34	0.08
Water stargrass			2	0.00
Nitella			<1	trace
Coontail			<1	trace
Non-native				
Hydrilla			40	0.10
Alligatorweed			4	0.01

[1]Abiotic habitat features

Table 5. Percent directed angler effort by species for Richland-Chambers Reservoir, Texas, June 2004 through May 2005, June 2006 through November 2006 and March through May 2007, and June 2010 through May 2011. For black basses, percent of tournament-angler effort are in parentheses.

Species	Year		
	2004/2005	2006/2007*	2010/2011
Catfishes	4	7	16
Temperate basses	32	45	39
Largemouth bass	54	26 (59%)	19 (42%)
Crappies	6	8	16
Anything	4	14	10

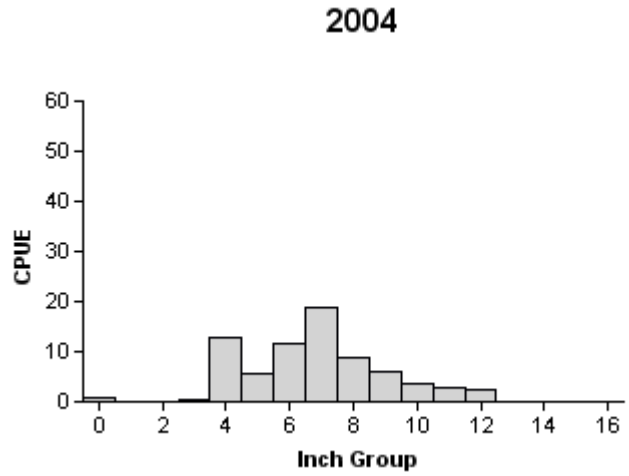
*Winter quarter was not included in the 2006-2007 creel survey.

Table 6. Total fishing effort (h) for all species and total directed expenditures at Richland-Chambers Reservoir, Texas, June 2004 through May 2005, June 2006 through November 2006 and March through May 2007, and June 2010 through May 2011.

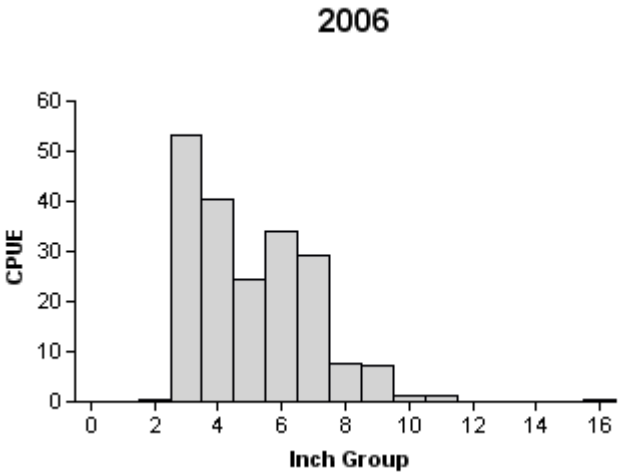
Creel Statistic	Year		
	2004/2005	2006/2007*	2010/2011
Total fishing effort	152,252	97,870	87,679
Total directed expenditures	$1,517,049	$1,213,312	$1,021,728

*Winter quarter was not included in the 2006-2007 creel survey.

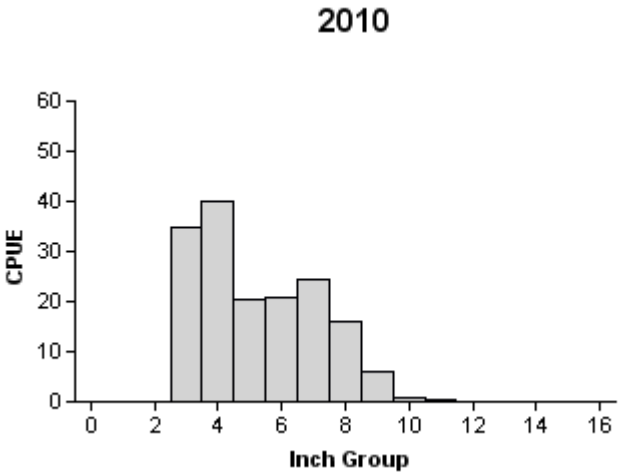
Gizzard Shad



Effort = 2.0
Total CPUE = 74.5 (25; 149)
Stock CPUE = 43.0 (32; 86)
IOV = 65.58 (7)



Effort = 2.0
Total CPUE = 198.6 (19; 393)
Stock CPUE = 46.5 (23; 92)
IOV = 91.35 (2.5)



Effort = 2.0
Total CPUE = 164.5 (13; 329)
Stock CPUE = 48.0 (33; 96)
IOV = 85.71 (4.8)

Figure 2. Number of gizzard shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Richland-Chambers Reservoir, Texas, 2004, 2006, and 2010.

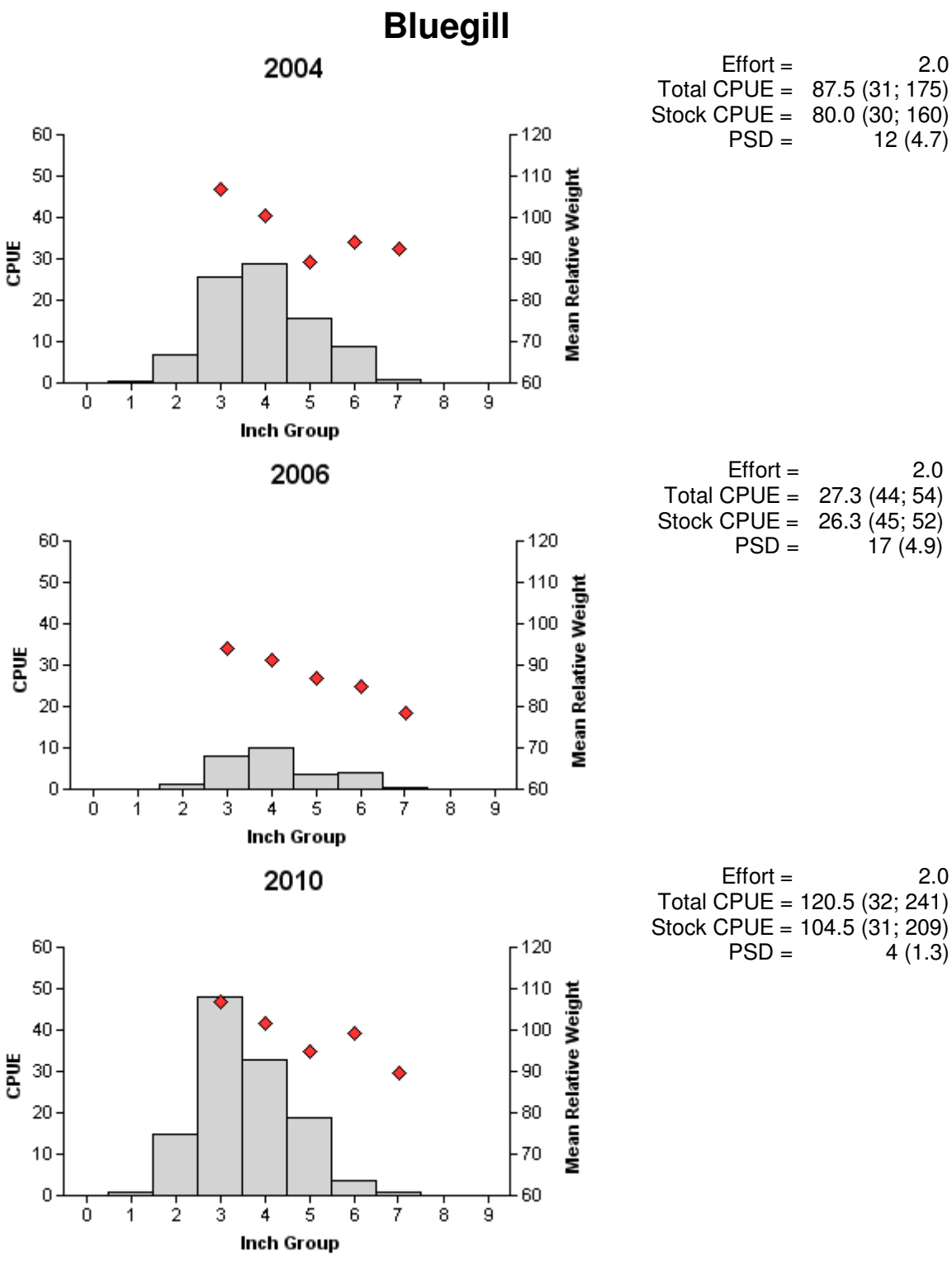
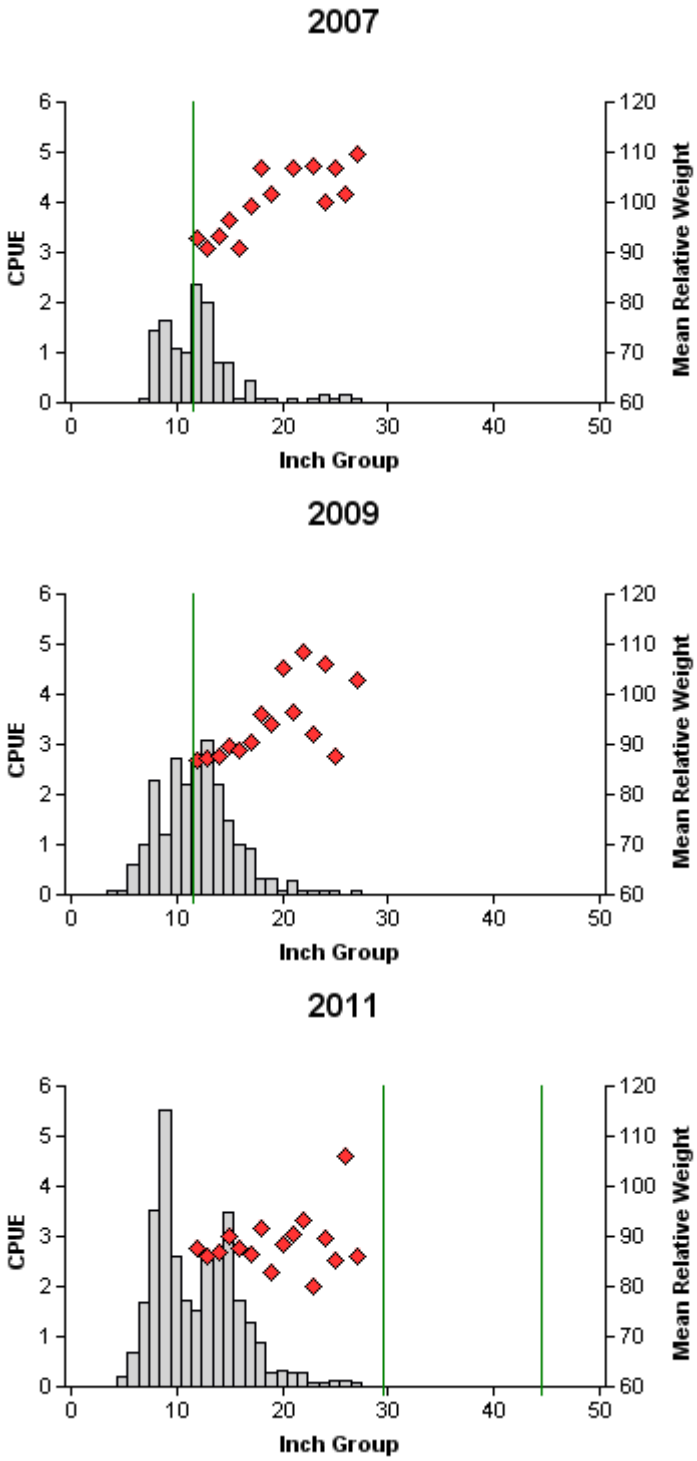


Figure 3. Number of bluegill caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE are in parentheses) for fall electrofishing surveys, Richland-Chambers Reservoir, Texas, 2004, 2006, and 2010.

Blue Catfish



Effort =	14.0
Total CPUE =	12.4 (27; 173)
Stock CPUE =	7.1 (35; 100)
PSD =	8 (3.1)
PSD-P =	0 (0)

Effort =	15.0
Total CPUE =	22.8 (15; 342)
Stock CPUE =	12.7 (13; 190)
PSD =	5 (1.5)
PSD-P =	0 (0)

Effort =	15.0
Total CPUE =	31.7 (15; 475)
Stock CPUE =	15.7 (20; 236)
PSD =	8 (1.7)
PSD-P =	0 (0)

Figure 4. Number of blue catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure in parentheses) for spring gill net surveys, Richland-Chambers Reservoir, Texas, 2007, 2009, and 2011. Vertical lines indicate minimum length limit or protected slot length limit at time of survey.

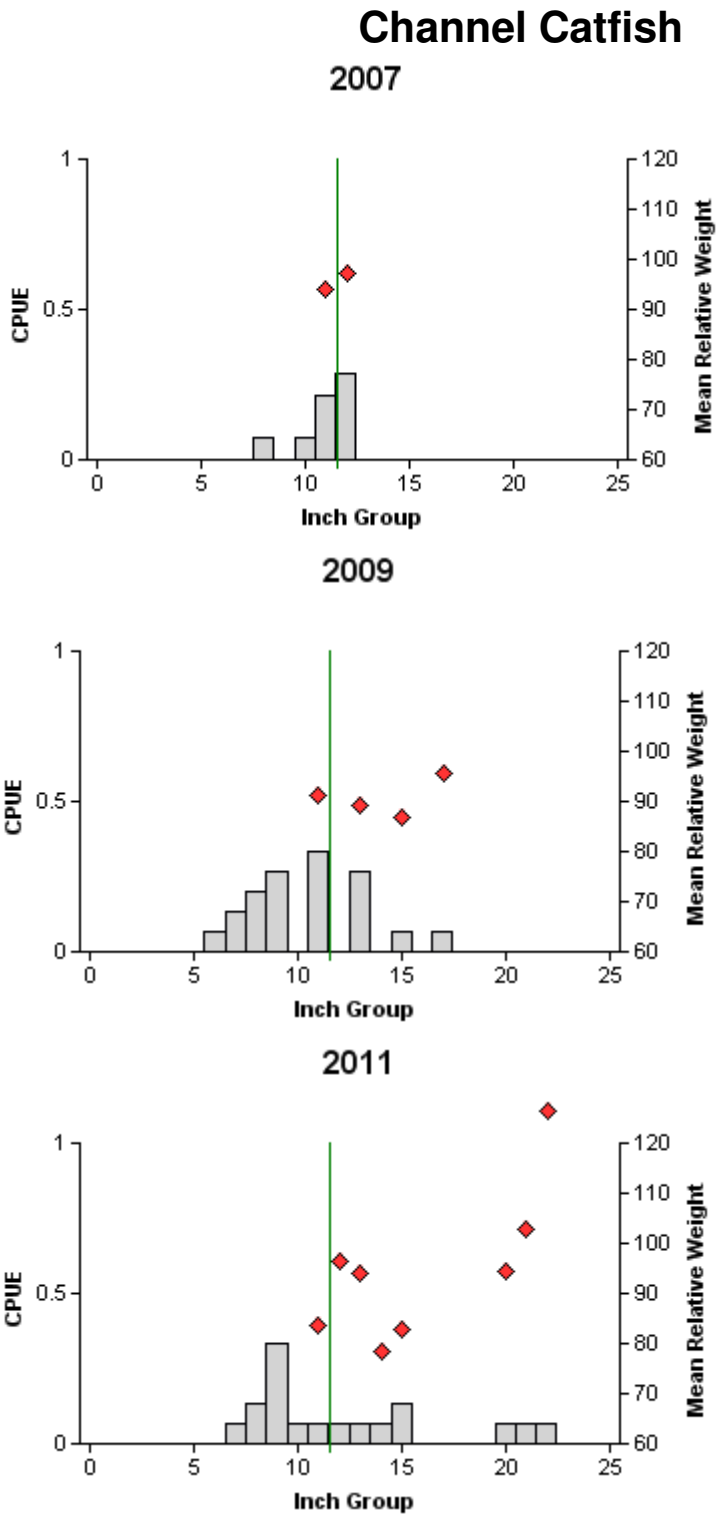


Figure 5. Number of channel catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Richland-Chambers Reservoir, Texas, 2007, 2009, and 2011. Vertical lines indicate minimum length limit.

Catfishes

Table 7. Creel survey statistics for catfishes at Richland-Chambers Reservoir, Texas from June 2004 through May 2005, June 2006 through November 2006 and March through May 2007, and June 2010 through May 2011, where total catch per hour is for anglers targeting catfishes and total harvest is the estimated number of catfishes harvested by all anglers. Relative standard errors (RSE) are in parentheses.

Creel Survey Statistic	Year		
	2004-2005	2006-2007*	2010-2011
Directed effort (h)	6,626 (50)	5,780 (29)	7,036 (49)
Directed effort/acre	0.2 (50)	0.2 (29)	0.2 (49)
Total catch per hour	0.2 (46)	1.9 (46)	0.6 (19)
Total harvest	22,147 (73)	11,849 (69)	7,626 (91)
Channel catfish	6,718 (106)	2,302 (155)	767 (359)
Blue catfish	15,429 (58)	9,547 (48)	6,859 (61)
Harvest/acre	0.5 (73)	0.3 (69)	0.2 (91)
Channel catfish	0.2 (106)	<0.1 (155)	0.02 (359)
Blue catfish	0.4 (58)	0.2 (48)	0.2 (61)
Percent legal released	0	<1	<1

* Winter quarter was not included in the 2006-2007 creel survey.

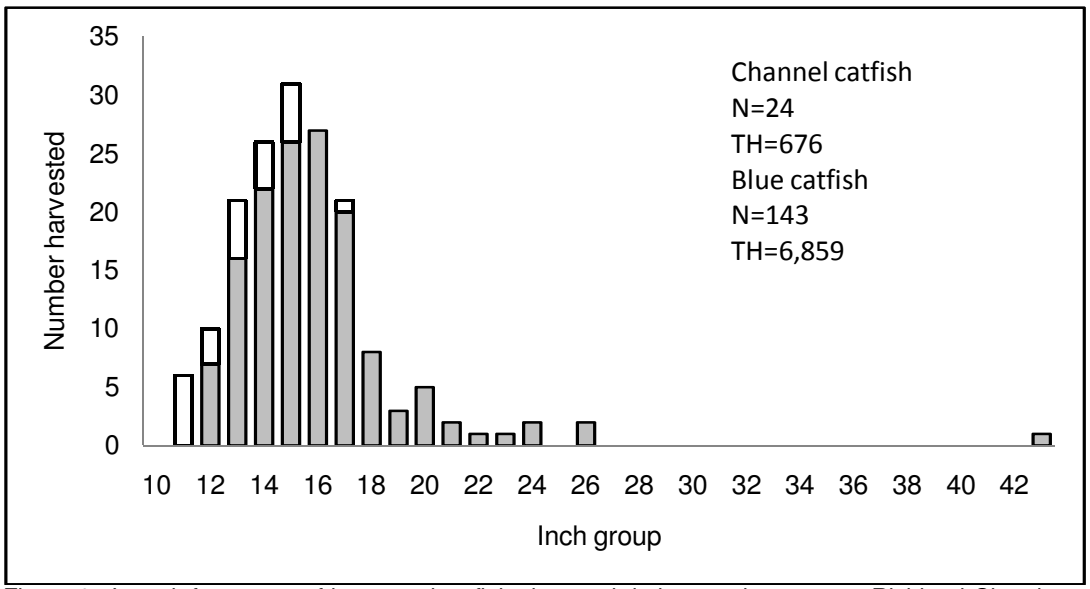


Figure 6. Length frequency of harvested catfish observed during creel surveys at Richland-Chambers Reservoir, Texas, June 2010 through May 2011, all anglers combined. Gray columns indicate Blue Catfish, and white columns indicate Channel Catfish. N is the number of harvested catfish observed during creel surveys, and TH is the total estimated harvest for the creel period.

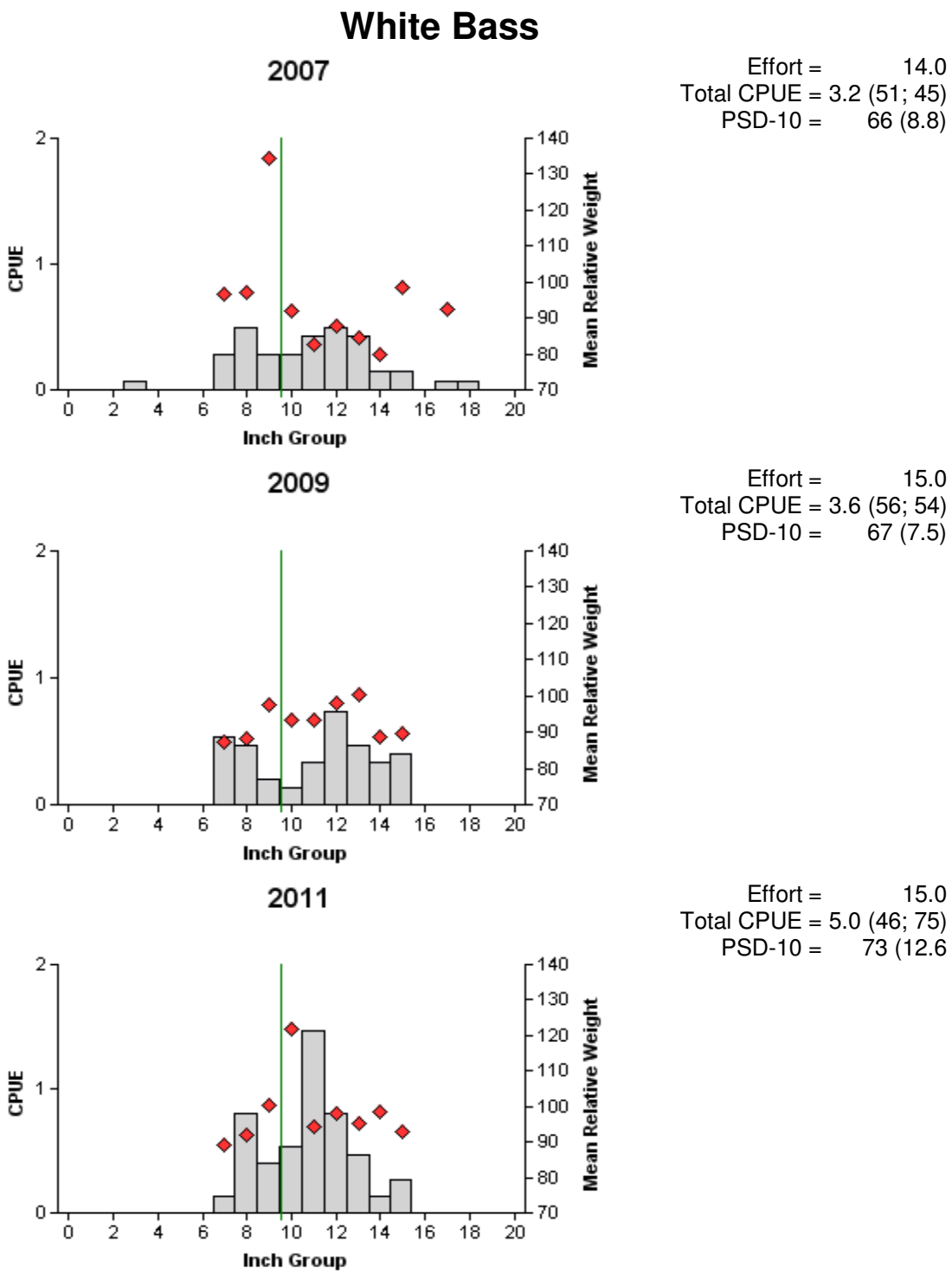


Figure 7. Number of white bass caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for spring gill net surveys, Richland-Chambers Reservoir, Texas, 2007, 2009, and 2011. Vertical lines indicate minimum length limit.

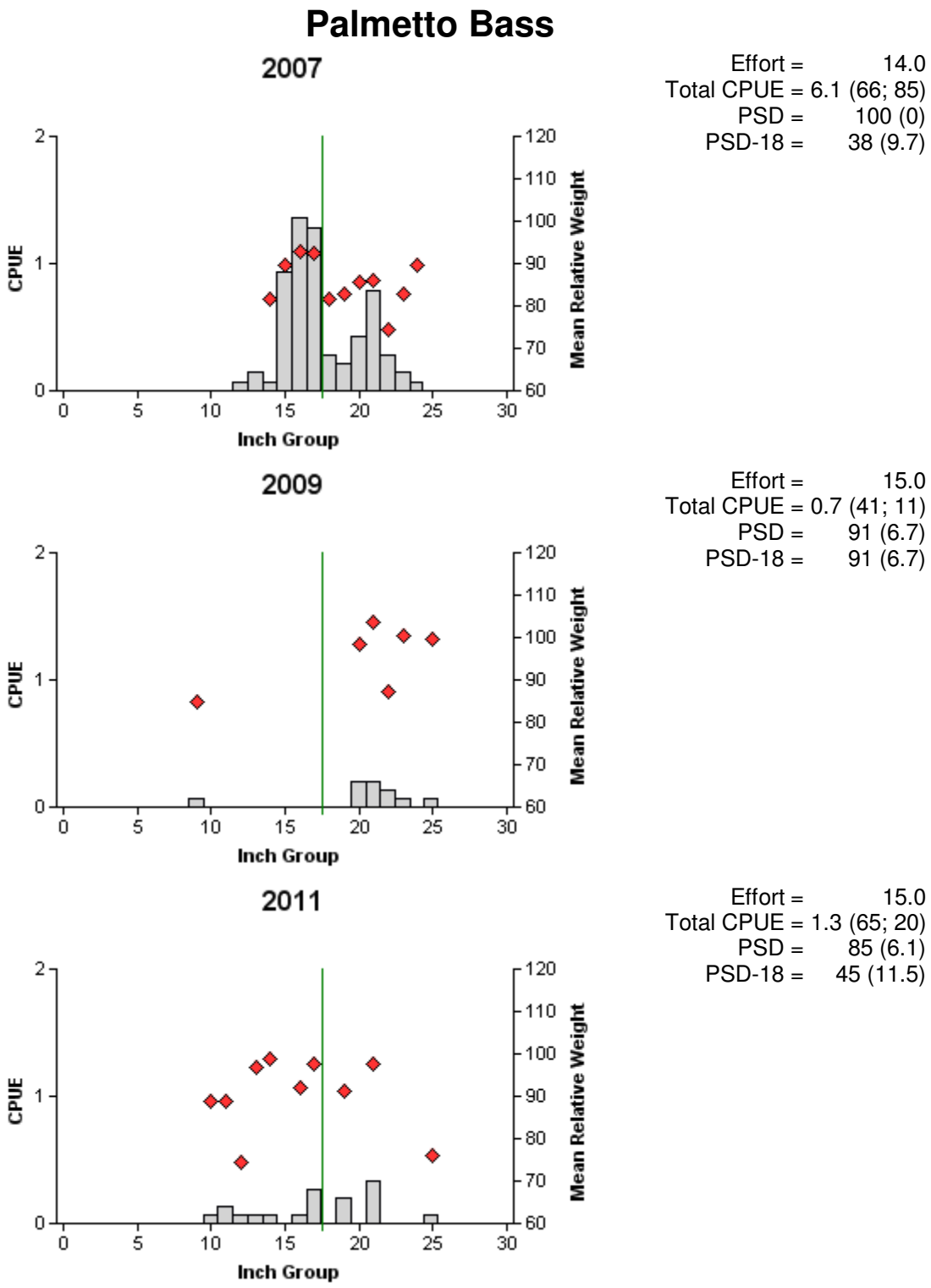


Figure 8. Number of palmetto bass caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N are in parentheses) for spring gill net surveys, Richland-Chambers Reservoir, Texas, 2007, 2009, and 2011. Vertical lines indicate minimum length limit.

Temperate basses

Table 8. Creel survey statistics for temperate basses at Richland-Chambers Reservoir, Texas from June 2004 through May 2005, June 2006 through November 2006 and March through May 2007, and June 2010 through May 2011, where total catch per hour is for anglers targeting temperate basses and total harvest is the estimated number of temperate basses harvested by all anglers. Relative standard errors (RSE) are in parentheses. No directed effort or harvest was observed from June 2006 through May 2007.

Creel Survey Statistic	Year		
	2004-2005	2006-2007*	2010-2011
Directed effort (h)	48,238 (29)	48,830 (20)	33,944 (22)
Directed effort/acre	1.2 (29)	1.1 (20)	0.8 (22)
Total catch per hour	3.4 (58)	6.4 (64)	3.8 (21)
Total harvest			
White Bass	141,214 (31)	103,478 (23)	70,588 (24)
Palmetto Bass	2,165 (225)	8,370 (45)	6,792 (64)
Harvest/acre			
White Bass	3.4 (31)	2.5 (23)	1.7 (24)
Palmetto Bass	>0.1 (225)	0.2 (45)	0.2 (64)
Percent legal released			
White Bass	1	9	21
Palmetto Bass	N/A	18	0

* Winter quarter was not included in the 2006-2007 creel survey.

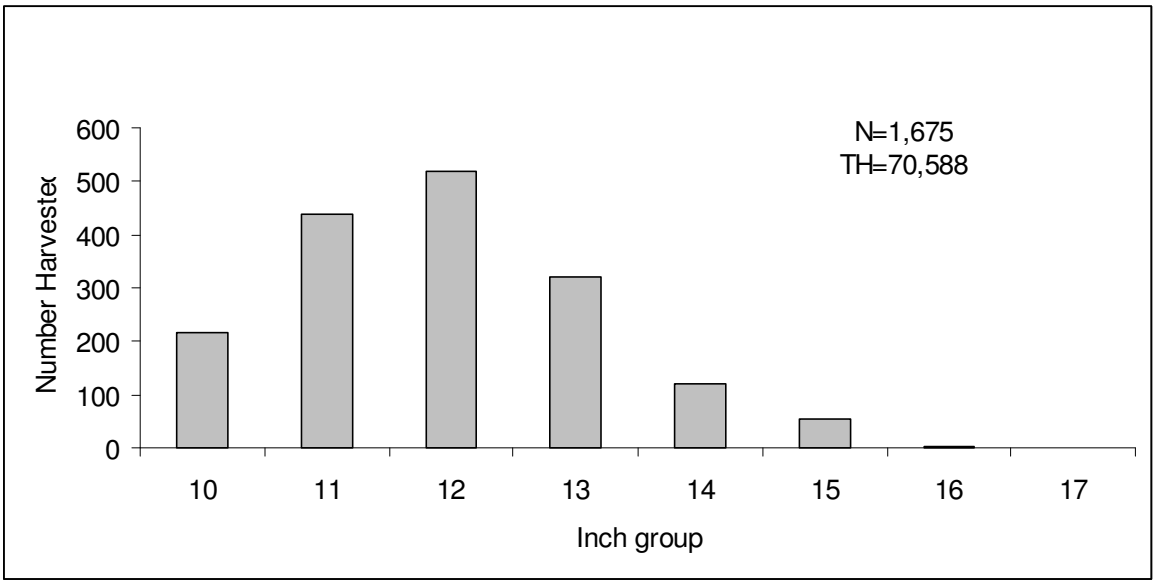


Figure 9. Length frequency of harvested white bass observed during creel surveys at Richland-Chambers Reservoir, Texas, June 2010 through May 2011, all anglers combined. N is the number of harvested white bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

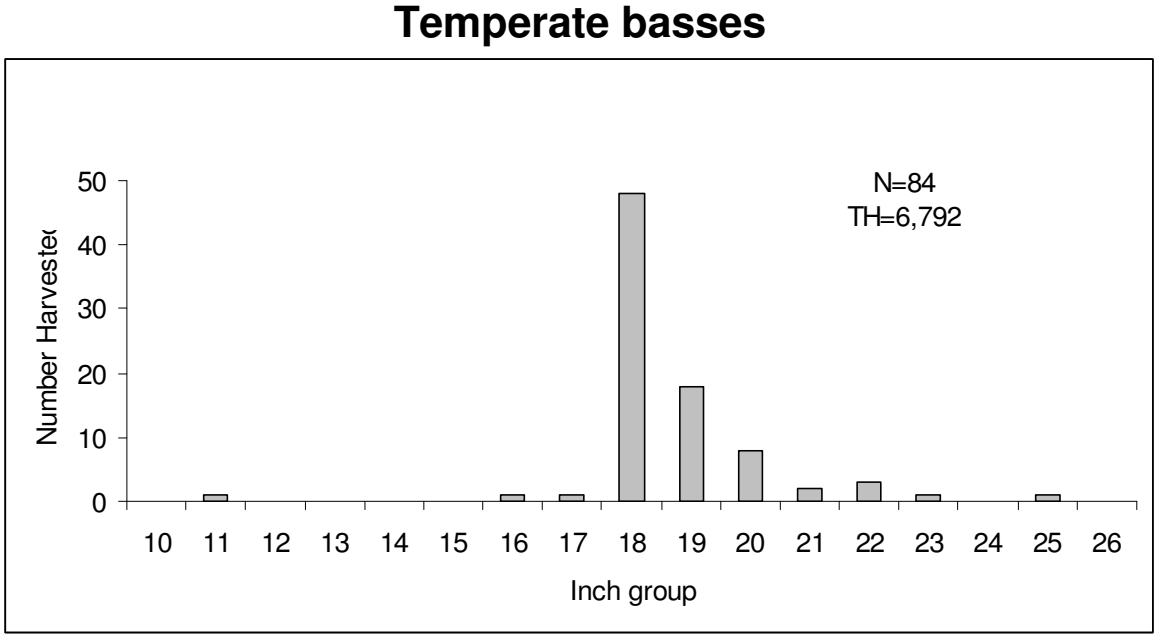


Figure 10. Length frequency of harvested Palmetto bass observed during creel surveys at Richland Chambers Reservoir, Texas, June 2010 through May 2011, all anglers combined. N is the number of harvested Palmetto bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

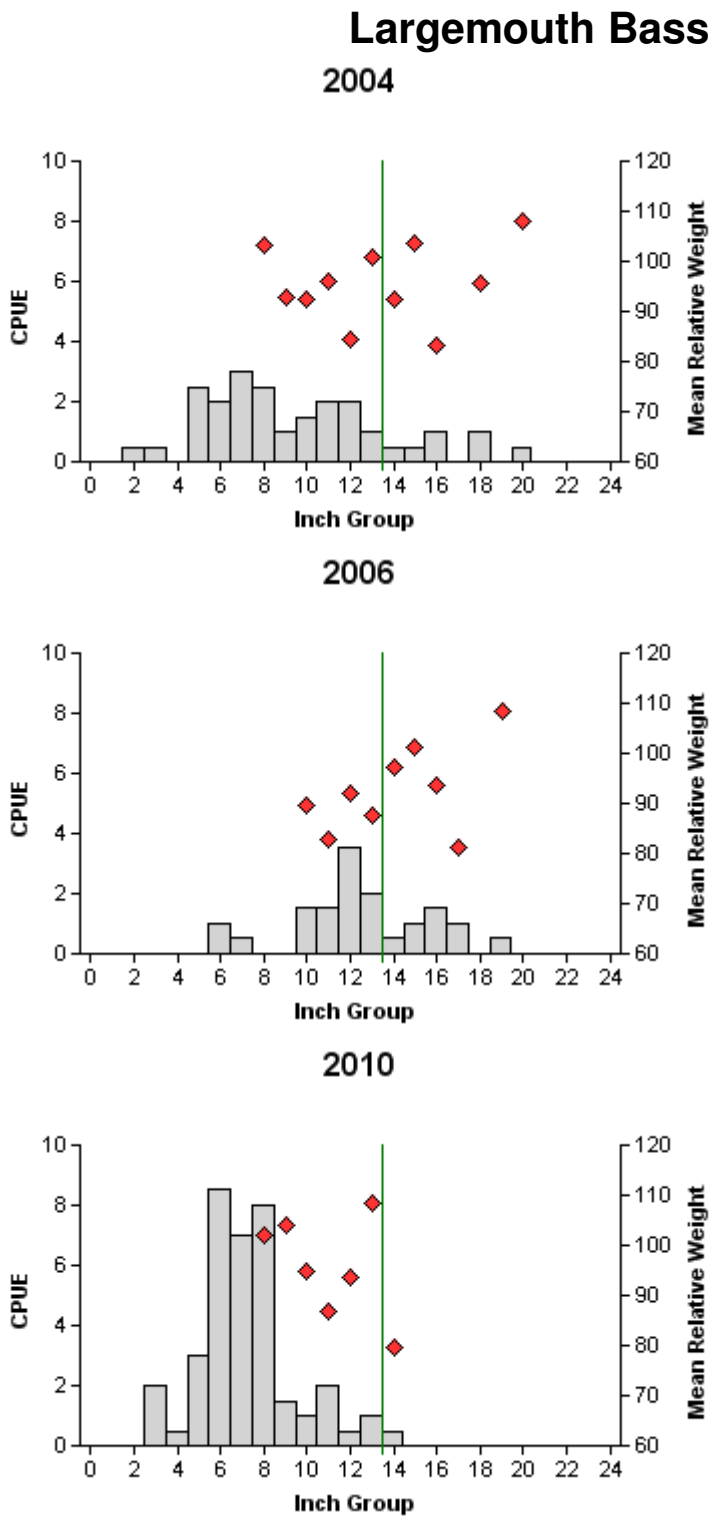


Figure 11. Number of largemouth bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE are in parentheses) for fall electrofishing surveys, Richland-Chambers Reservoir, Texas, 2004, 2006, and 2010. Vertical lines indicate minimum length limit.

Black basses

Table 9. Creel survey statistics for black basses at Richland-Chambers Reservoir, Texas from June 2004 through May 2005, June 2006 through November 2006 and March through May 2007, and June 2010 through May 2011, where total catch per hour is for anglers targeting black basses and total harvest is the estimated number of black basses harvested by all anglers. Relative standard errors (RSE) are in parentheses.

	Year		
Creel Survey Statistic	2004-2005	2006-2007*	2010-2011
Directed effort (h)	82,455 (33.3)	21,716 (19.3)	16,967 (26)
Directed effort/acre	2.0 (33.3)	0.63 (19.3)	0.41 (26)
Total catch per hour	0.5 (16.9)	0.4 (52.1)	0.5 (25)
Total harvest	34,061 (48.2)	3,285 (67.7)	2,106 (124)
Traditional harvest		511	190
Tournament retained		2,774	1,916
Harvest/acre	0.8 (48.2)	0.08 (67.7)	0.05 (124)
Percent legal released	14	45	21

* Winter quarter was not included in the 2006-2007 creel survey.

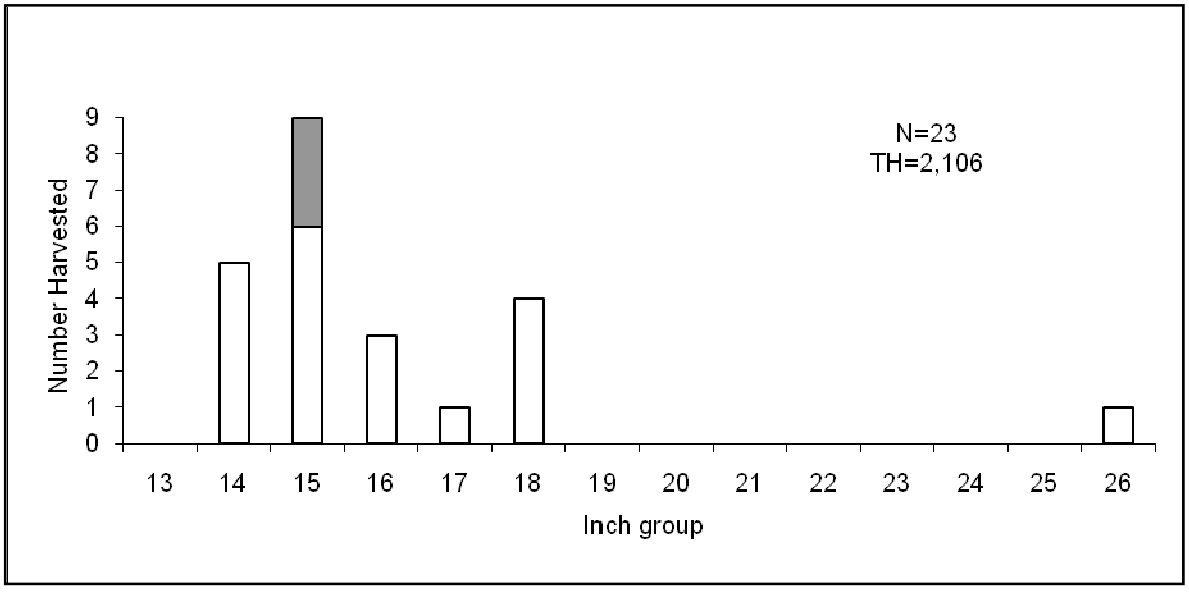


Figure 12. Length frequency of harvested largemouth bass (white = tournament-retained; gray = harvested) observed during creel surveys at Richland-Chambers Reservoir, Texas, June 20010 through May 2011, all anglers combined. N is the number of harvested largemouth bass observed during creel surveys, and TH is the total estimated harvest for the creel period.

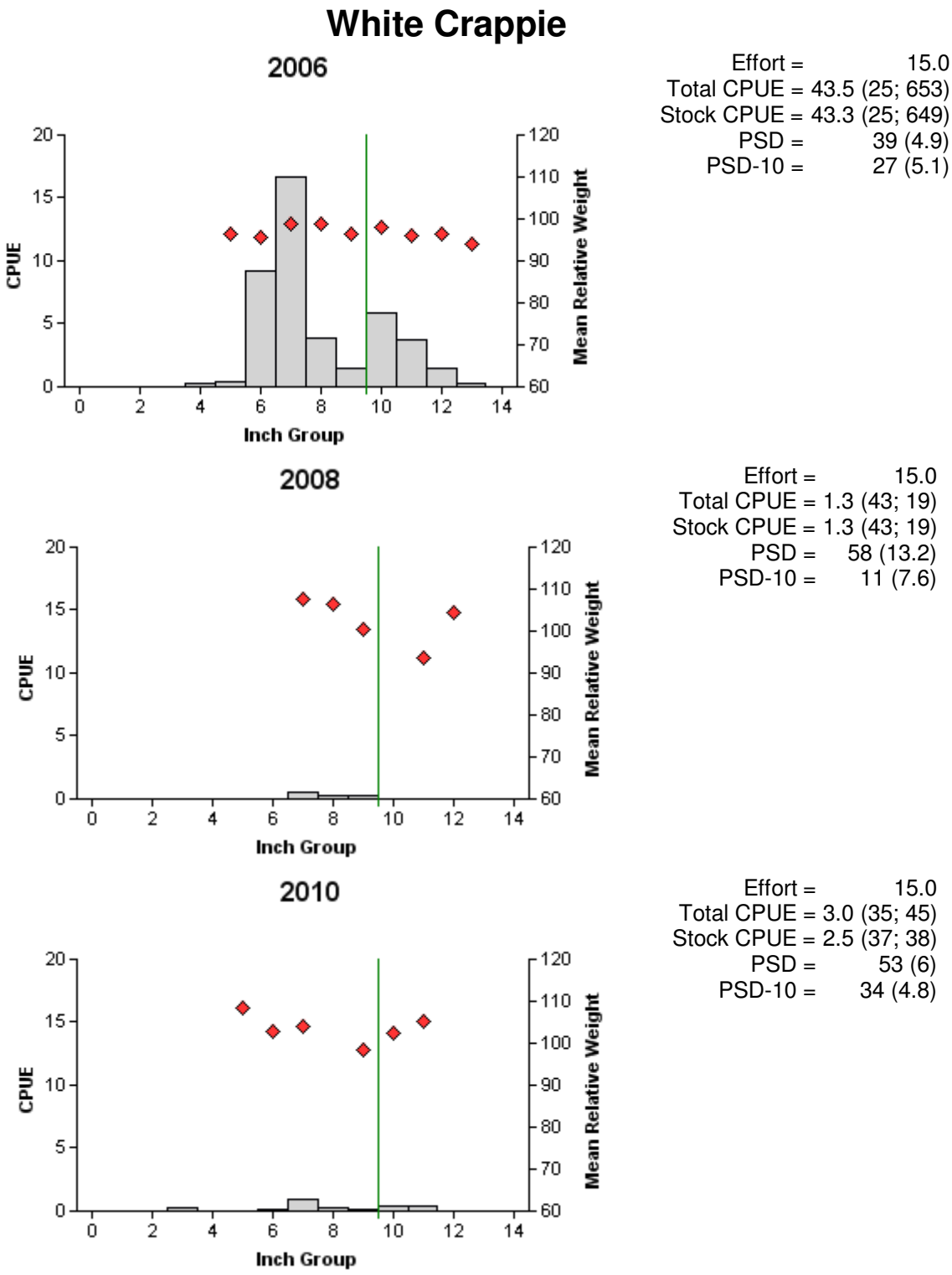


Figure 13. Number of white crappie caught per net night (CPUE, bars), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Richland-Chambers Reservoir, Texas, 2006, 2008, and 2010. Vertical lines represent length limit at time of survey.

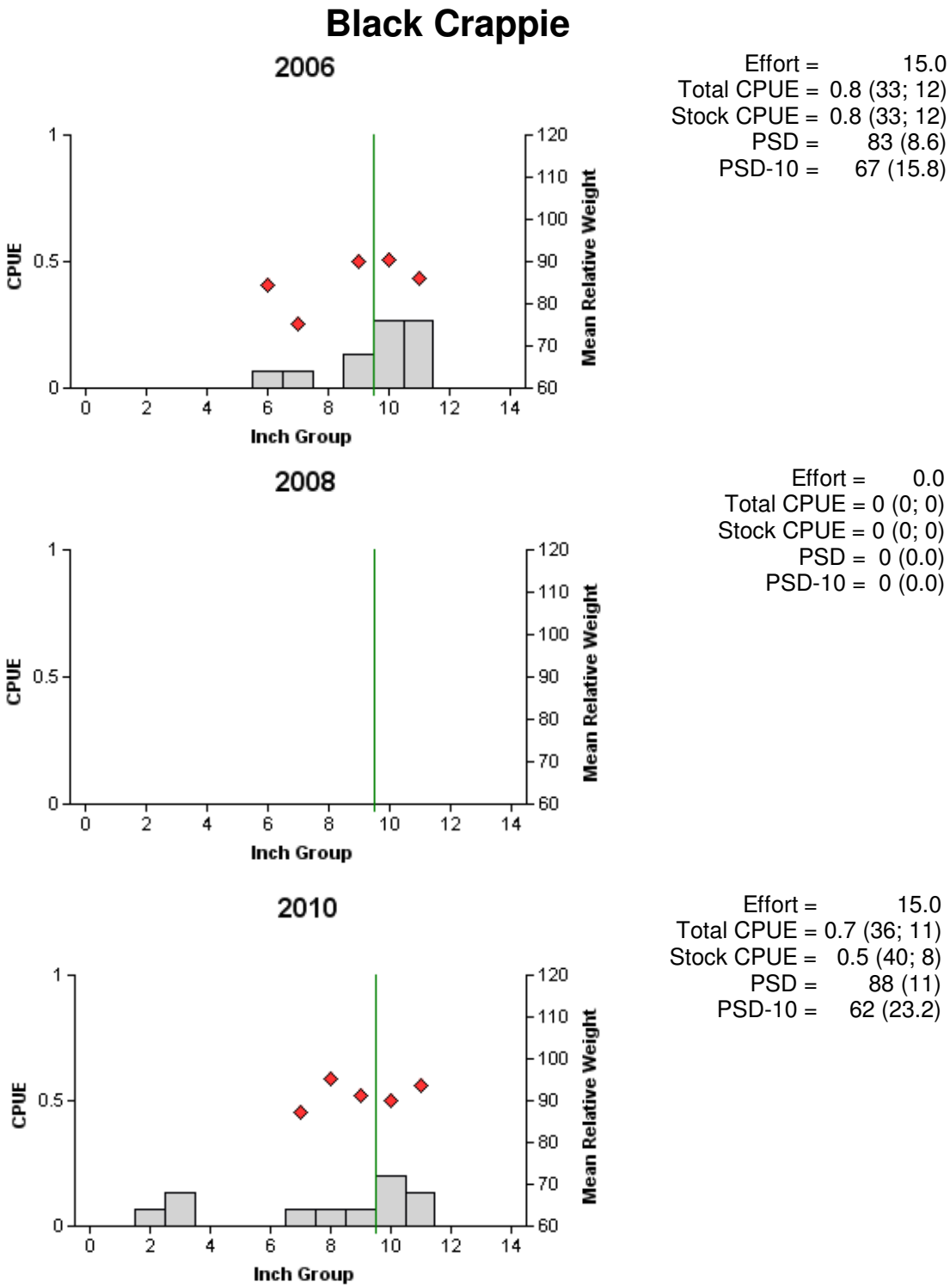


Figure 14. Number of black crappie caught per net night (CPUE, bars), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall trap net surveys, Richland Chambers Reservoir, Texas, 2006, 2008, and 2010. Vertical lines represent length limit at time of survey.

Crappies

Table 10. Creel survey statistics for crappies at Richland-Chambers Reservoir, Texas from June 2004 through May 2005, June 2006 through November 2006 and March through May 2007, and June 2010 through May 2011, where total catch per hour is for anglers targeting crappies and total harvest is the estimated number of crappies harvested by all anglers. Relative standard errors (RSE) are in parentheses.

	Year		
Creel Survey Statistic	2004/2005	2006/2007*	2010/2011
Directed effort (h)	9,138 (30)	7,930 (27)	14,345 (26)
Directed effort/acre	0.2 (30)	0.19 (27)	0.35 (26)
Total catch per hour	1.5 (46)	2.0 (31)	2.0 (51)
Total harvest	8,983 (130)	17,562 (56)	17,206 (62)
White crappie	8,834 (92)	15,805 (44)	8,272 (51)
Black crappie	149 (2,417)	1,757 (164)	8,933 (71)
Harvest/acre	0.2 (130)	0.4 (56)	0.4 (62)
White crappie	0.2 (92)	0.38 (44)	0.2 (51)
Black crappie	>0.1 (2,417)	0.04 (164)	0.2 (71)
Percent legal released	0	5	0

* Winter quarter was not included in the 2006-2007 creel survey.

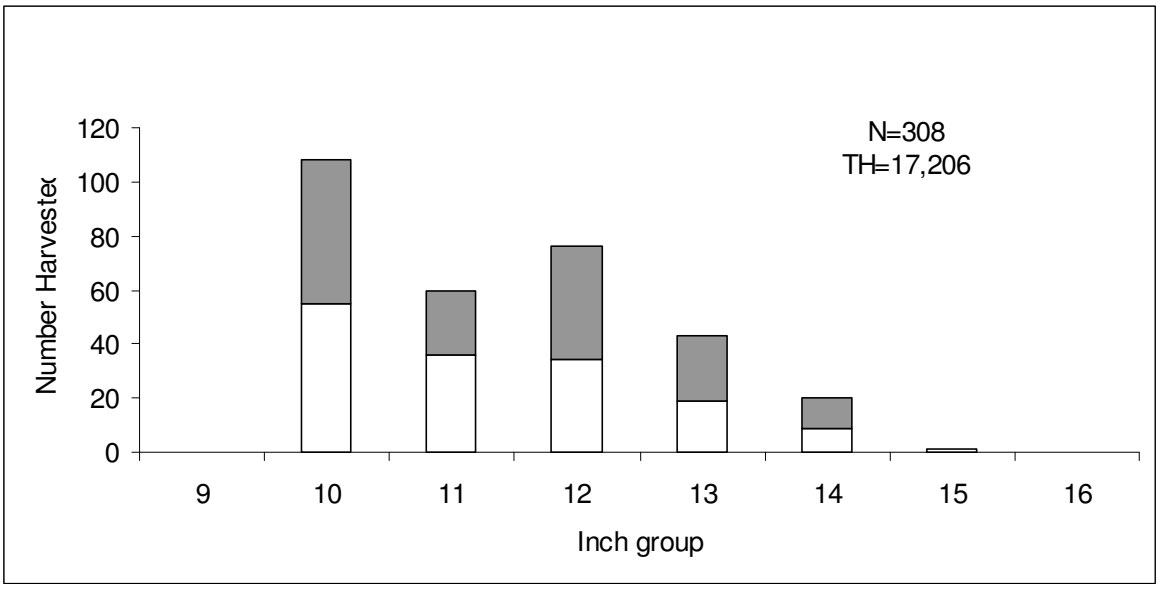


Figure 15. Length frequency of harvested crappies (white = white crappie; grey = black crappie) observed during creel surveys at Richland-Chambers Reservoir, Texas, June 2010 through May 2011, all anglers combined. N is the number of harvested crappies observed during creel surveys, and TH is the total estimated harvest for the creel period.

Table 11. Proposed sampling schedule for Richland Chambers Reservoir, Texas. Gill netting surveys are conducted in the spring, while electrofishing and trap netting surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

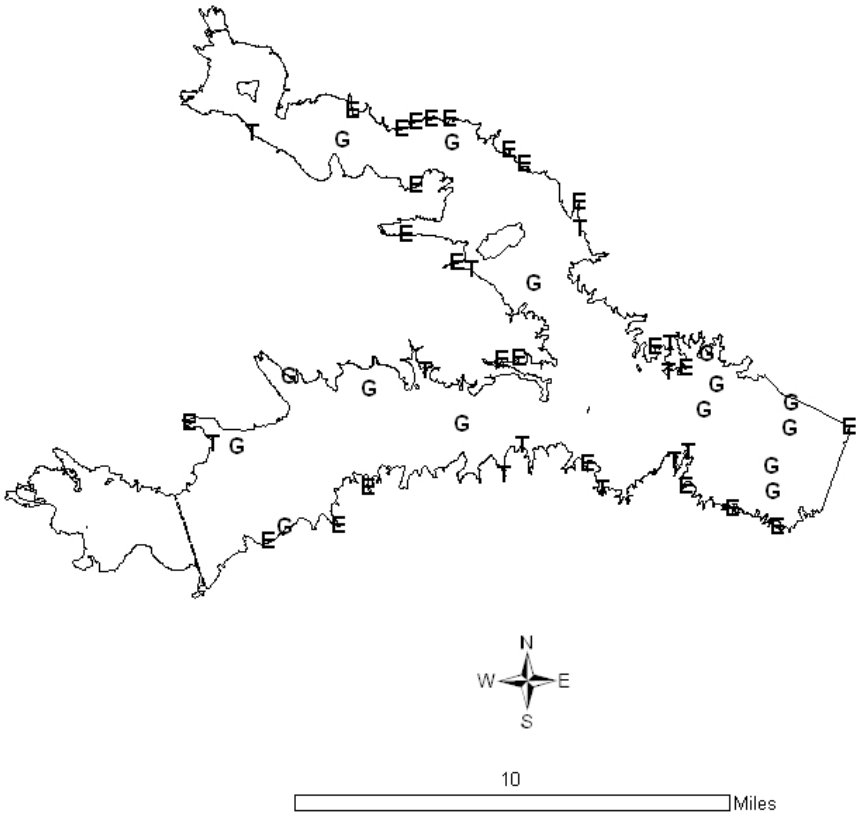
Survey Year	Electrofisher	Gill Net	Trap Net	Creel Survey	Angler Access	Vegetation	Report
June 2011-May 2012							
June 2012-May 2013		A	A				
June 2013-May 2014							
June 2014-May 2015	S	S	A	S	S	S	S

APPENDIX A

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Richland-Chambers Reservoir, Texas, 2010 to 2011.

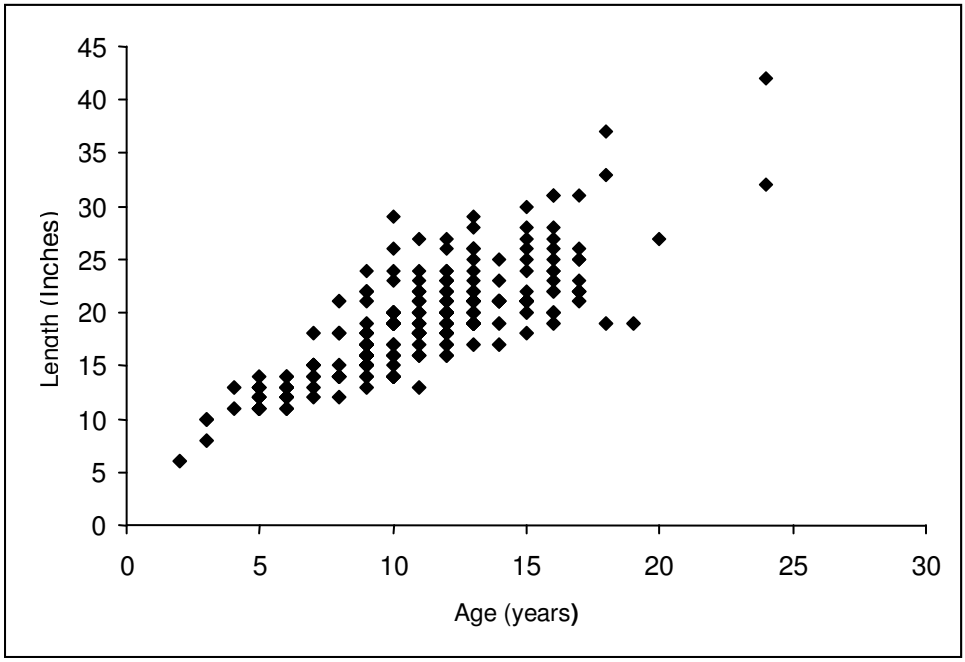
	Gill Netting		Electrofishing		Trap Netting	
Species	N	CPUE	N	CPUE	N	CPUE
Gizzard shad			329	164.5		
Threadfin shad			275	137.5		
Blue catfish	475	31.7				
Channel catfish	18	1.2				
White bass	75	5				
Palmetto Bass (striped X white bass hybrid)	20	1.3				
Redbreast sunfish			66	33		
Warmouth			7	3.5		
Bluegill			241	120.5		
Longear sunfish			48	24		
Redear sunfish			9	4.5		
Largemouth bass			71	35.5		
White crappie					45	3
Black crappie					11	0.7

APPENDIX B



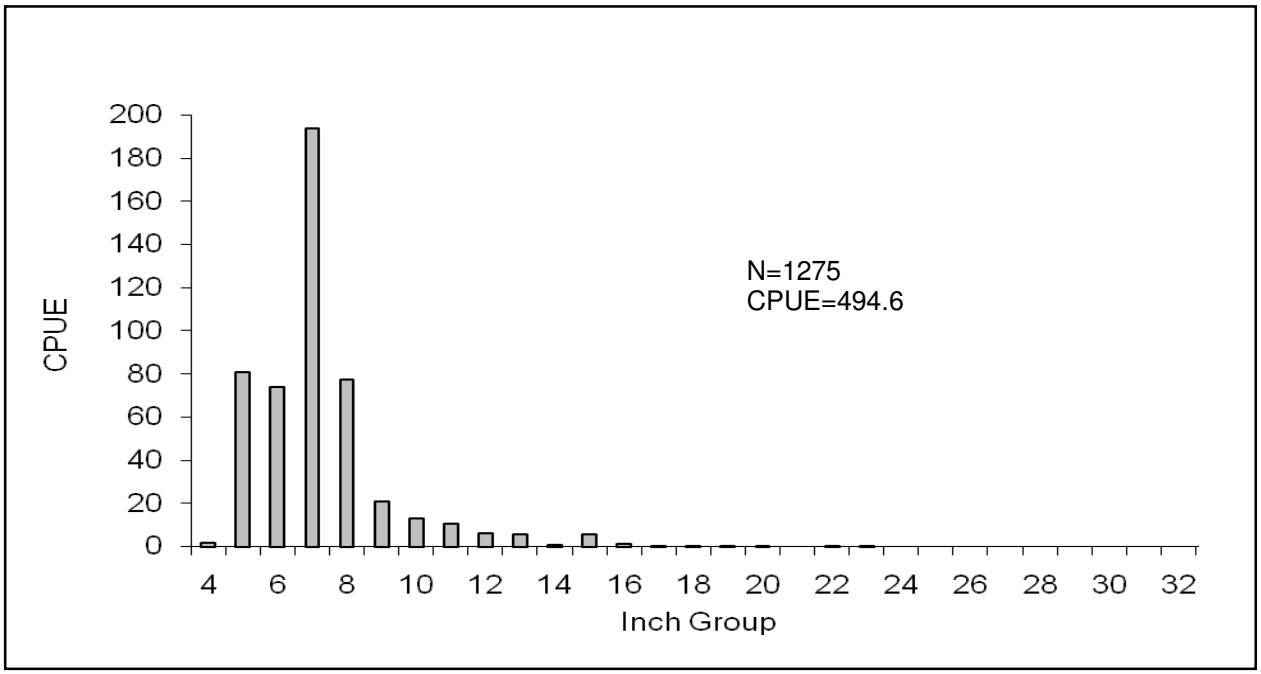
Location of sampling sites, Richland-Chambers Reservoir, Texas, 2010 to 2011. Gill netting, trap netting, and electrofishing stations are indicated by G, T, and E, respectively.

APPENDIX C



Length at age of blue catfish collected by jug line and gill net February-April 2009 and by jug line December-April 2010 at Richland-Chambers Reservoir.

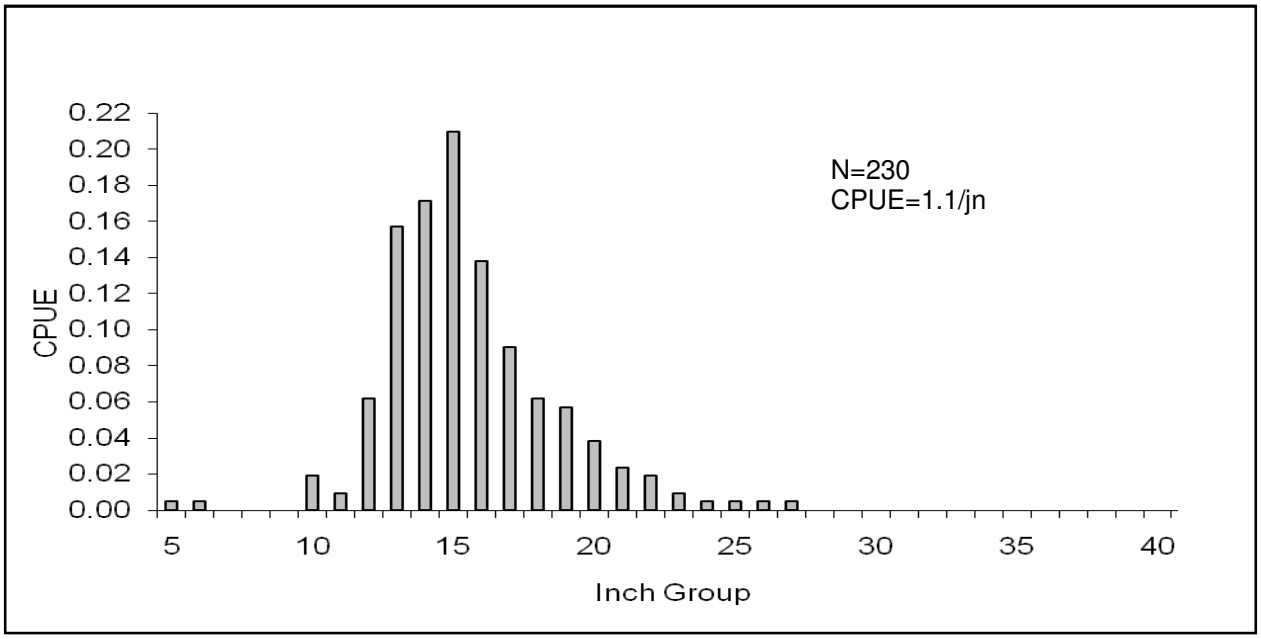
APPENDIX D



Length frequency of blue catfish collected by electrofishing August 2009 at Richland Chambers. N is the total number of harvested blue catfish observed during the electrofishing survey, and CPUE is the number of blue catfish observed per hour of sampling effort.

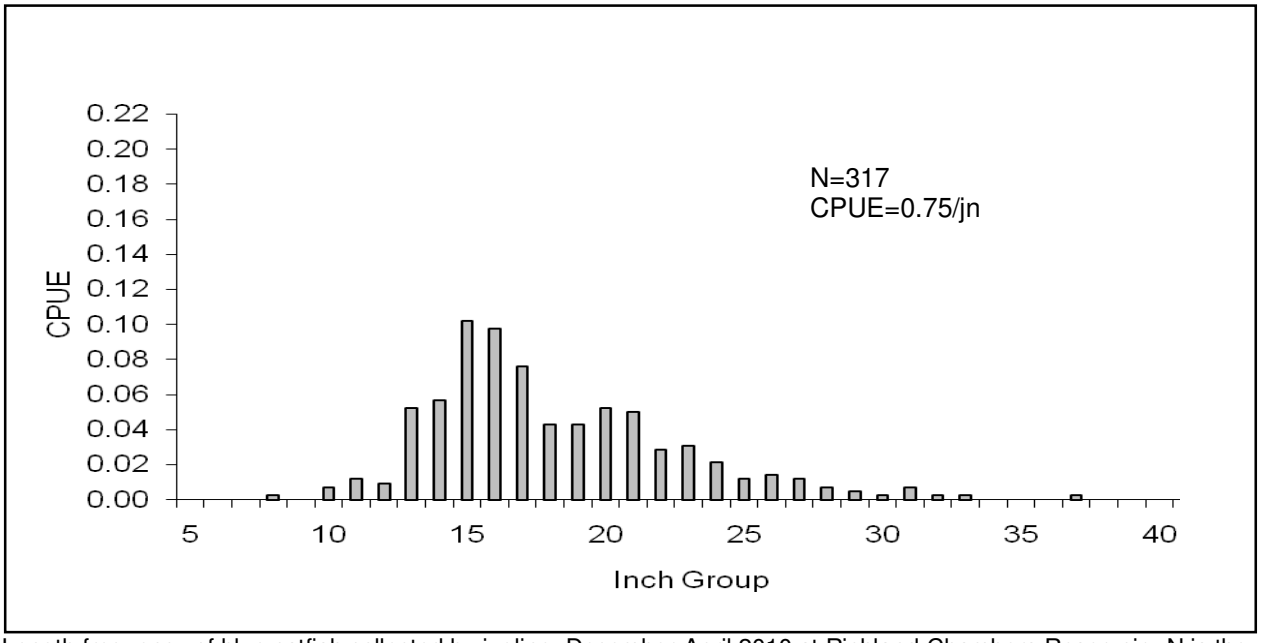
APPENDIX E

2009



Length frequency of blue catfish collected by jugline, February-April 2009 at Richland-Chambers Reservoir. N is the total number of harvested blue catfish during the jugline survey, and CPUE is the number of blue catfish observed per jugline night (fish/jn).

2010



Length frequency of blue catfish collected by jugline, December-April 2010 at Richland-Chambers Reservoir. N is the total number of harvested blue catfish during the jugline survey, and CPUE is the number of blue catfish observed per jugline night (fish/jn).